Introduction to veterinary epidemiology and risk analysis

Background

The current context of international trade in animals and animal products requires that all sanitary and phytosanitary measures should be scientifically based and not be used as artificial barriers to trade. This requires the strengthening of surveillance systems and the development of risk analysis capabilities to appropriately assess the risk and prevent the introduction of diseases through trade. Training in this field has been limited; USDA:APHIS in collaboration with the Association of Teachers of Veterinary Public Health and Preventive Medicine (ATVPHPM) several years ago, recognized the need to enhance the epidemiological skills and created a program to train its field staff in the basic concepts of epidemiology. In 1994 a first attempt to conduct a similar training with a special emphasis in risk analysis was developed with a group of Mexican veterinarians. The success of that course was due to the integration of epidemiology into the risk analysis process and the fact that lectures were provided in Spanish.

The ATVPHPM and the USDA:APHIS:VS Centers for Epidemiology and Animal Health –the OIE Collaborating Center for Animal Disease Information Systems and Risk Analysis–?are offering a two week course in Spanish for animal health officers working in official veterinary services whose responsibilities include surveillance of animal diseases and risk analysis.

Objective

Provide participants with basic technical skills of risk analysis methods and the key epidemiological components needed in conducting surveillance and monitoring.

Instructors

Jorge Hernández, University of Florida
Dave Hird, University of California-Davis
Mo Salman, Colorado State University
Cristóbal Zepeda, OIE Collaborating Center for Disease Surveillance and Risk Analysis

Language

Instruction and discussion will be held in Spanish

Cost

Participants are expected to cover their travel expenses and accommodation

Location and dates

August 5-16 2002. The course will be held at USDA :APHIS :VS Centers of Epidemiology and Animal Health (CEAH) Fort Collins, Colorado.

Course objectives

Participants will acquire basic epidemiological skills; they will learn to apply appropriate epidemiologic tools in animal disease surveillance/survey systems in order to conduct valid risk analyses. Emphasis is placed on analysis and interpretation of field data, diagnostic test results, and the use economic principles in animal health. Existing survey and surveillance systems and their application in risk analysis process will be demonstrated as part of the course.

Course contents

Veterinary Epidemiology: Basic concepts

Monitoring and surveillance

1. Epidemiological principles and considerations for designing and conducting survey, monitoring and surveillance
2. Methods for data collection, storage and management for these systems
3. Measuring disease frequency and its application in animal health decision-making. Principles and considerations when estimating disease level at the country/region level.
4. Measuring/estimating risk from survey/surveillance data

Epidemiological principles for disease control strategies

1. Selection of strategies for disease control
2. How do specific options affect risk the analysis process?

Application of statistics in epidemiology and risk analysis process

1. Probability distributions
2. Central tendency measures
3. Data dispersion measures
4. Hypothesis testing (p values, confidence intervals)
5. Type I and II errors and power of the test

Data presentation

1. Types of data
2. Tables, graphs and charts

Properties of diagnostic tests

1. Sensitivity and specificity
2. Characteristics of diagnostic and screening tests
3. Validity and repeatability of a test
4. Predictive values and their relationship to sensitivity, specificity and prevalence
5. The impact of testing and disease detection on surveillance and risk analysis process

Economics in animal health issues

1. Application of economic principles to animal health program analysis and decision making process
2. Structure and philosophies of trade and markets with reference to government control strategies

Risk Analysis

1. Overview of the risk analysis process
2. The relationship between epidemiology and the risk assessment process
3. Developing the risk assessment process
    3.1. Hazard identification
    3.2. Release assessment
    3.3. Exposure assessment
    3.4. Consequence assessment

Example applications

4.1 Qualitative
4.2 Quantitative

During the course field visits to livestock operations will be organized with the purpose to discuss the relationship between private operations and regulatory veterinary professionals in the implementation of disease control strategies.